

Tunable Seed Lasers for Laser Remote Sensing of CO₂ and O₂, Phase I

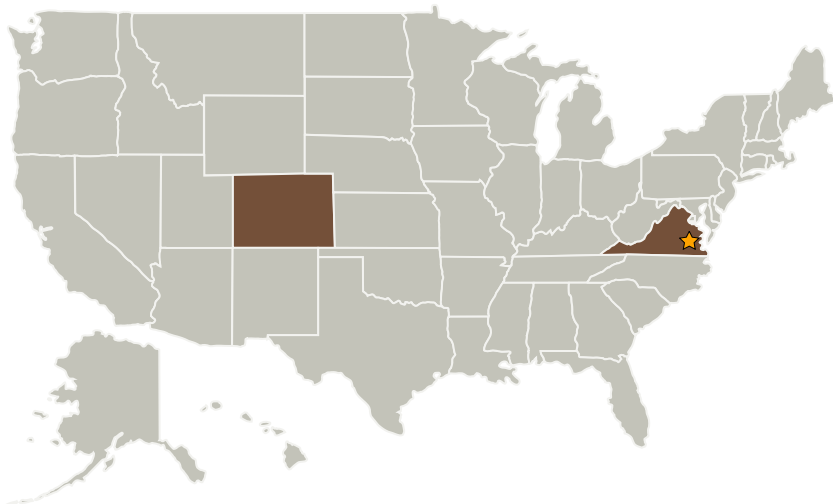
Completed Technology Project (2009 - 2009)



Project Introduction

Vescent Photonics propose to develop a chip-sized narrow linewidth (< 50 kHz), widely tunable (> 10 nm's) diode laser that will be suitable for a wide variety of NASA remote sensing missions. The proposed laser platform enables easy selection of the laser center wavelength; these lasers can be easily built for any wavelength that a diode laser gain chip exists (< 670 nm to > 2.5 microns). Since spectral features of important molecular species cover a large wavelength window this center-wavelength flexibility is advantageous. This effort will focus on lasers operating in the 1.57 and 2.0 micron CO₂ band, and the 1.26 micron O₂ band, such as is required for ASCENDS-type missions. Rapid wide wavelength tunability will enable scans over large portions of spectral bands, which can minimize the impact of contaminant and thermal effects on total column density measurement. These lasers will provide for very fast phase (up to 10 GHz) modulation and be built with space qualifiable components. Collaborative relationships with established aerospace companies will be exploited to facilitate insertion of this technology into NASA missions.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Vescent Photonics, Inc.	Supporting Organization	Industry	Arvada, Colorado



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Colorado

Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
 - └ TX02.1 Avionics Component Technologies
 - └ TX02.1.2 Electronic Packaging and Implementations